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MONTHLY REPORT

July, August 1975

Contract Number: NAS9-13303

QUANTITATIVE DETERMINATION

OF

STRATOSPHERIC AEROSOL CHARACTERISTICS

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MONTHLY REPORT  
July, August 1975

Altitude scaling and inversion of limb brightness to attenuation coefficients were attempted on Pass 47, bands 1-4, scans 101-120. The twenty scans were smoothed and averaged to remove the effects of gaussian noise. The periodic low frequency noise was also modeled and removed for these scans and bands. Each band was scaled by comparing its brightness to a model derived for that band. The scaled and calibration intensity was then mathematically inverted to find attenuation coefficients as a function of altitude. The Mie component was obtained by subtracting the value of the Rayleigh coefficients. Figure 1 shows the results for band 3 represented as a ratio of Mie coefficients to Rayleigh coefficients. For comparison Figure 2 shows the 1968 Elterman Mie empirical model represented the same way.

The results for bands 1, 2 and 4 were not as expected. Apparently we were unable to remove the noise sufficiently. It is also possible that the models were inaccurate. If this were true, the calibration of the data and the preparation of the data for inversion would be in error. Model discrepancies would mostly likely be caused by errors in the Skybet data which in turn would cause errors in the sun angle. They could also be caused with much less effect by actual changes in the atmosphere. Because we are short of analysis time and because noise is the probable cause of error, we elected to accept the results of band 3 and to continue analysis of other data rather than dwell on these scans.

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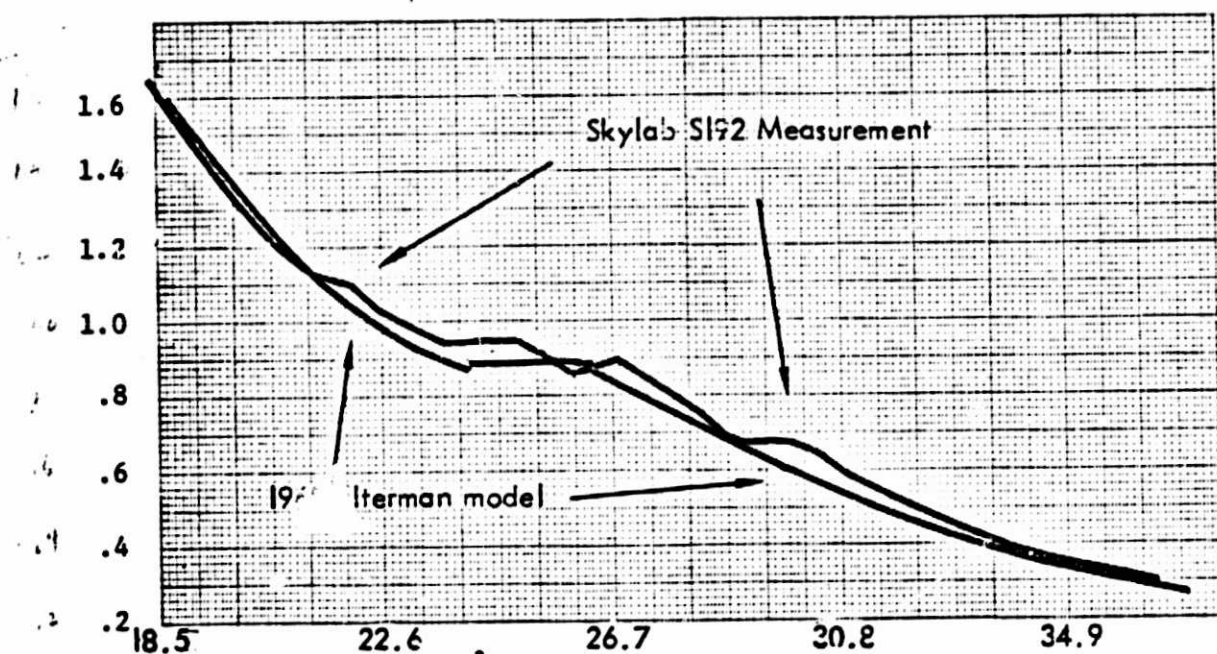


Figure 1 Attenuation Coefficients (Ratio of Mie to Rayleigh). Pass 47 Band 3. Scans 101-120.

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Twenty scans of pass 78, tape 933015, bands 1-12 were selected for analysis. We found that in all bands except 1, 2 and 3 many scans could not be used because they contain zeros. We attribute the zeros to the large high frequency noise found, notably in bands 5, 8, 10, 11 and 12. We attempted to salvage some data by interpolating through zeros where possible. The inversion of band 1 is shown in figure 2. The results are again represented as the ratio of Mie coefficients to Rayleigh (model) coefficients. The 1968 Elterman model is also shown for comparison.

Band 13 of the same scans of pass 78 contained only a few non-zero points in all of the scans. Figure 3 shows that the non-zero points were not randomly distributed. Judging from shorter wavelength bands of the same scans, points 413 through 433 lie approximately between 15 and 20 Km.

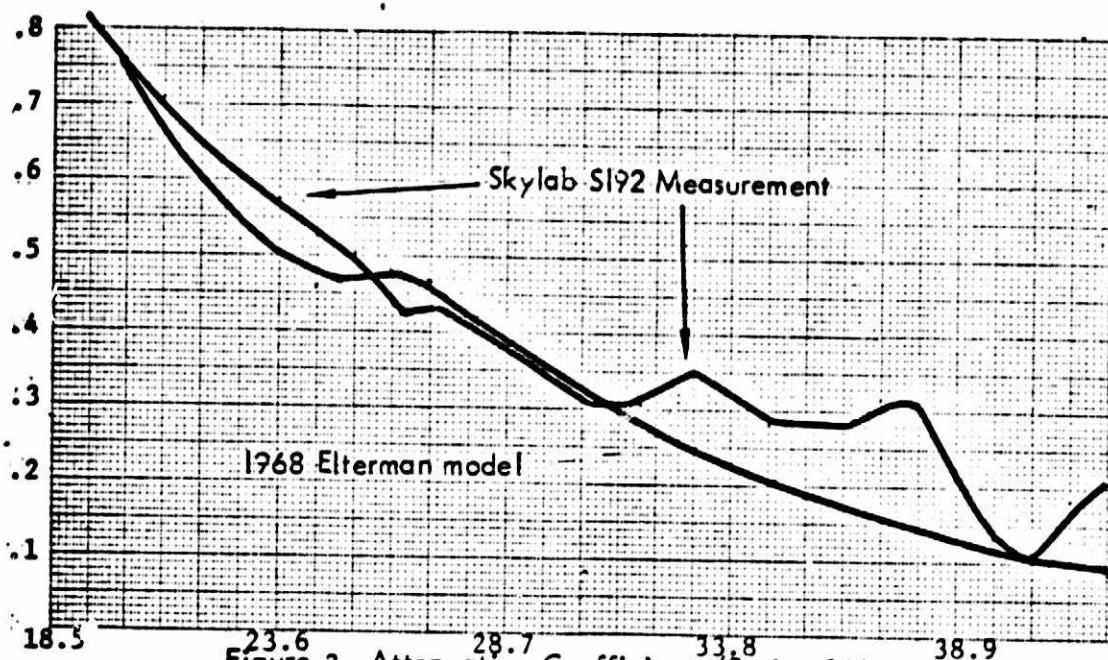


Figure 2 Attenuation Coefficients (Ratio of Mie to Rayleigh) Pass 78. Band 1. Scans 236-255

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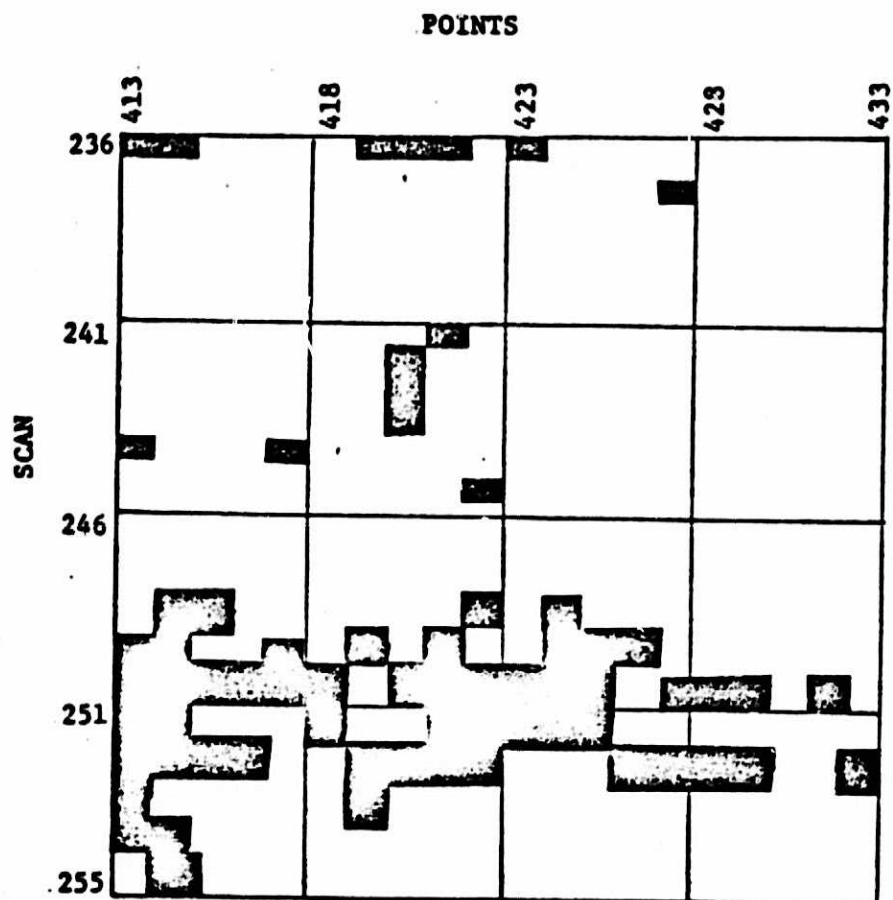


Figure 3: Nonzero Data Points of Band 13  
Pass 78 Band 13 Scans 236-255